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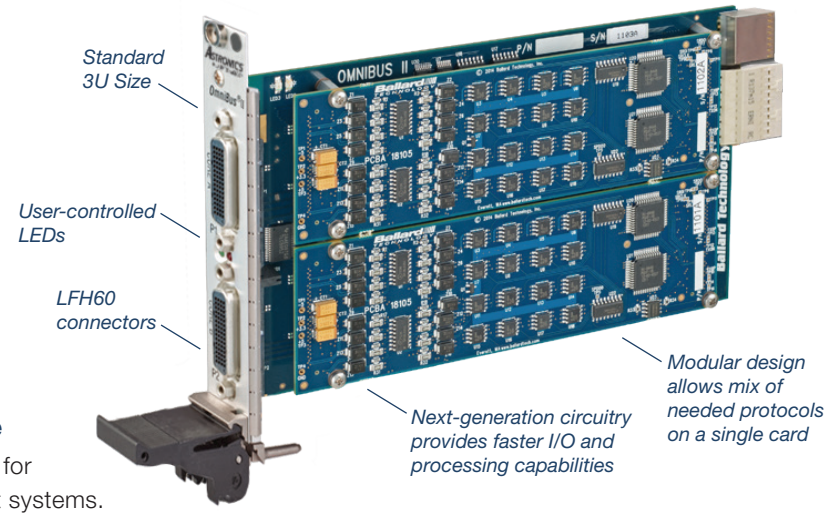
OmniBus II
PXI Express Interfaces

Available Interfaces

MIL-STD-1553
ARINC 429 / 575
ARINC 708 / 453
ARINC 717 / 573
RS-232/422/485
Avionics Discrete I/O
TTL Level Discrete I/O

COMPATIBLE WITH NATIONAL INSTRUMENTS LabVIEW

LabVIEW compatible hardware and driver available at ni.com



Multi-Protocol Avionics Databus Interface

The OmniBus II PXI Express (PXIe) card is designed for use in multi-slot PXIe and CompactPCI Express test systems. It enables these systems to interface with multiple avionics databuses for testing, validating and simulating commercial and military avionics equipment and systems. The card is highly configurable and includes two internal Cores that can be populated with a variety of databus protocols and discrete I/O modules.

The OmniBus II PXIe is the next-generation of Ballard's popular OmniBus product with faster I/O and processing capabilities. With the newest advanced set of MIL-STD-1553 and ARINC 429 modules, users can verify wave form compatibilities, test functions of bus shorts and opens, and—when combined with our CoPilot® software—perform lab, production and flight test verification and simulation right out of the box. Readily available as Commercial Off-The-Shelf (COTS) products, the PCIe interface is perfect for challenging simulation, test, interface, and data recording applications.

Hardware

OmniBus II modules used on this card feature the latest 6th generation protocol engines and bus mastering to yield high performance. Power is obtained from the backplane bus—no supplemental power is needed. All cards are standard 3U size and include sixteen TTL level input/output discretes and IRIG time synchronization/generation. User software can indicate status by controlling the two LEDs.

Software

Users can develop their own software applications with the included BTIDriver™ API. With only a few function calls, a program can operate the interface card and process messages to and from the avionics databuses. Functions include routines for transmitting, receiving, scheduling, recording, time-tagging, and manipulating data. The interface card can use applications developed for other Ballard devices. Code migrates seamlessly from BTIDriver compatible devices or through a translation driver from older Ballard devices.

Alternatively, Ballard's optional CoPilot software provides easy-to-use, interactive tools for databus test, analysis, and simulation. CoPilot simplifies project development and provides added productivity through virtual instrument displays, flexible monitoring and analysis tools, and a powerful scripting engine.

Features

- Supports multiple protocols in one card
- Up to 4 MIL-STD-1553 databuses
- Up to 32 ARINC 429 databuses
- Up to 16 ARINC 717 databuses
- Up to 8 ARINC 708 databuses
- Up to 8 RS-232/422/485 serial ports
- Up to 64 avionics discrete I/O
- 16 bidirectional TTL level discrete I/O
- PXI triggers/syncs/clocks
- Advanced timing: IRIG, 10 MHz, and PPS
- Built-in test: PBIT, IBIT and CBIT
- CompactPCI Express (cPCIe) compatible

Software

- Universal BTIDriver™ API compatible
- Efficient DMA monitoring
- Compatible with other Ballard hardware
- Translator for older Ballard devices
- CoPilot® analysis & test software (optional)
- Data recorder software (optional)

Benefits

- Powerful protocol engines
- Easy installation
- Free customer support for product life
- 3-year limited warranty standard
- RoHS compliant

Applications

- Product development and validation
- Production testing
- Simulation of databus and I/O system traffic
- Data servers
- Data recorders
- System analysis and integration testing
- Performance monitoring and analysis

OmniBus II
PXI Express Interfaces

Example I/O Modules

MIL-STD-1553 - Standard Module

Up to 2 dual-redundant channels
BC/RT/MON (Single- or Multi-Function)
Hardware controlled transmit scheduling
Sequential monitor and Time Stamping
CH/TA/SA filtering
Error injection including MBZC shifting
Playback with errors
Amplitude control
16 Open/GND avionics discrete I/O

ARINC 429 - Standard Module

Up to 16 Tx/Rx configurable channels
Periodic and asynchronous messages
Hardware controlled transmit scheduling
Hardware playback mode
Receive message filtering (Label/SDI)
Sequential monitor and Time Stamping
Programmable bit rate
Error detection and injection
  Parity bit inversion
  +/- bit count (8-33 bits)
  Intermessage gap error

ARINC 429 - Advanced Module

Up to 8R/8T channels
Same features as Standard Module plus
Control of each bus leg as open, ground or normal operation
Transmit amplitude control (0 to 200%)
Transmit NULL control (-5V to 5V)

ARINC 708

Up to 2R/2T channels
Hardware controlled transmit scheduling
Receive message filtering
Software selectable bus termination
Sequential monitor and Time Stamping

ARINC 717

Up to 4R/4T channels
Biphase/Bipolar signaling
Sub-frame and super-frame support
64, 128, 256, 512, 1024, 2048, 4096, 8192 wps
Sequential monitor and Time Stamping

RS-232/422/485

4 ports
Programmable transmit gaps
Receive data time stamping
Error detection and injection

Avionics Discrete I/O

32 programmable Input/Output
Sequential monitor and Time Stamping
Hardware controlled output scheduling

Specifications

OmniBus II PXIe is available in a large number of configurations that all share the base model features below:

Base Model Features

- 2 Core I/O sites
- 8 bidirectional TTL discrete I/O per core
- 2 user controlled LED indicators per core
- 64 MB memory per core (ECC)
- Temperature monitoring

Advanced Timing

64-bit hardware time-tag (1ns resolution)
IRIG A/B input and output (AM, PWM)
  Generate or synchronize timer
  Synchronize hardware time-tags
10 MHz and PPS
  Frame synchronization
  Synchronize hardware time-tags

Interrupts/Logging

Poll or use interrupts
Configurable event log
Programmable event logging/interrupts from messages, tx schedules, and buffers

PXI Triggers/Syncs/Clocks

PXI_STAR, PXI_TRIG, PXIe_DSTAR, and PXIe_CLK100 signals
Route PXI triggers to BTIDriver triggers & syncs
3 syncs and 3 triggers per core
Integration to Advanced Timing functions

Specifications

Component Temperature: -40 to 85°C
Storage Temperature: -55 to 100°C
I/O Connectors: LFH60
Size: Standard 3U (100 x 160 mm)
PCIe bus: x1 lane, bus mastering
Power: +3.3 and +12 VDC
MTBF: TBD

Software

Universal BTIDriver API for C/C++, C#, VB, VB.Net, and LabVIEW™
MS Windows® and Linux® OS drivers
Translation DLLs for older Ballard devices
CoPilot analysis & test software (optional)
Call for latest language and OS support.

Ordering Information

Hardware

Part No. Example: **222-YYY-YYY**

"YYY" is a three-digit number corresponding to a wide variety of I/O modules. The card can accept one or two modules.

Example I/O Module Types

*Protocol**	*Selections*
MIL-STD-1553	Channel counts, parametric control, single- or multi-function
ARINC 429	Channel counts, parametric control, standard or advanced functionality
ARINC 708	Channel counts, parametric control
ARINC 717	Channel counts, parametric control
Serial	Add RS-232/422/485
Discrete I/O	Add 32 discrete I/O lines

**Contact factory for other protocols.*

CoPilot Systems

To include CoPilot, place "CP-" before the above Part Number.
Example: CP-222-544-441

Cables and Accessories

Order separately. Ballard offers a wide selection. Visit www.ballardtech.com or contact factory for more information.

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